

S/135/60/000/005/001/009

A115/A029

AUTHORS: Kushnerev, D.M., Candidate of Technical Sciences; Grebel'nik, M.P.,  
Engineer

TITLE: Ceramic Flux for Automatic Welding of <sup>16</sup>1X18H9T (<sup>16</sup>1Kh18N9T) Stainless  
Steel <sup>16</sup>

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 5, pp. 1 - 4

TEXT: The purpose of this study was to find out a ceramic flux which would secure resistance of weldments to intercrystallite after-welding corrosion; high quality of weldments was sought with d-c or a-c applied, and finally, the possibility of application of standardized Ca-1X18H9T (Sv-1Kh18N9T) wire. The indispensable requirement for the composition of a ceramic flux for welding high-alloyed austenite steel is a minimum of oxidizing elements in the melting pool; this is the only way to obtain high concentrations of chromium and titanium in the seam. In this respect, the most suitable fluxes are composed on fluorine basis. The disadvantage of these fluxes is their low stabilizing capacity suitable for welding with d-c only. The fused metal is slightly oxidized by welding with flux made of CaO, MgO, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>. CaO and MgO should be preferred since ✓

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Ceramic Flux for Automatic Welding of 1X18H9T (1Kh18N9T) Stainless Steel

lime slags reduce the content of sulfur. In the case of marble, during welding calcium oxide is generated, affecting the health of the welder, attempts to avoid this obstacle failed. Calcination of marble with  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$  does not eliminate hydration. Nevertheless, the use of marble electrodes secures high quality seams in weldments of chrome-nickel steels; therefore, many compositions of ceramic flux have been tried out and the following found most suitable for welding steel 1Kh18N9T: marble 57 - 60%, magnesite brick 9 - 10%, alumina 4 - 5%, fluorspar 5 - 6%,  $\text{TiO}_2$  14 - 16%. Good results have been achieved by bringing in- to the flux ferro-silicon. K-8 (K-8) flux is composed as follows: 54 - 58%  $\text{CaCO}_3$ , 8.5 - 11%  $\text{MgO}$ , 14 - 15%  $\text{TiO}_2$ , 4.5 - 5%  $\text{Al}_2\text{O}_3$ , 5.0 - 6%  $\text{CaF}_2$ , 4.0 - 5.0%  $\text{SiO}_2$ , 1.5 - 2.0%  $\text{Na}_2\text{O}$ , 3.6 - 3.9%  $\text{Si}$ , 1.1 - 1.4%  $\text{Fe}$ , 0.1%  $\text{S}$  and  $\text{P}$ . This ceramic flux secures good seams, easy removal of slag crust (Fig. 1) and high resistance against pores and blisters. When welding steel 1Kh18N9T under K-8 flux with Sv-1Kh18N9T and 3W606 (EI606) wires (Table 3), the metal of the seam has two-phase austenite-ferrite structure with only 3 - 5% of ferrite (Fig. 2). The mechanical characteristics of the seam are not inferior to those of the basic metal (Fig. 4). Exposure for a prolonged time to 750°C did not affect the toughness of the welded seam (Table 5). Ceramic flux K-8 has found widespread appli-

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Ceramic Flux for Automatic Welding of 1X18<sup>9</sup>T (1Kh18N9T) Stainless Steel  
cation in machinery and chemical industries. There are 3 figures, 6 tables and  
5 Soviet references.

ASSOCIATION: Institut Electrotekhniki Akademii Nauk Ukrainskoy SSR (Electrotech-  
nical Institute of the AS Ukr SSR)



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*KUSHNEREV, D.M.*

PHASE I BOOK EXPLOITATION

SOV/5911

Khrenov, Konstantin Konstantinovich, and Daniil Matveyevich Kushnerov

Keramicheskiye flyusy dlya avtomaticheskoy svarki i naplavki (Ceramic Fluxes for Automatic Welding and Facing) Kiyev, Gostekhizdat UkrSSR, 1961. 262 p. 4000 copies printed.

Ed.: A. Novik; Tech. Ed.: L. Gorkavenko.

PURPOSE: This book is intended for technical personnel and scientific research workers. It may also be useful to students at schools of higher technical education and tekhnikums training specialists in welding.

COVERAGE: Results of the study of new ceramic [unfused] fluxes and their related type, the magnetic fluxes, are presented. The use of these fluxes in various branches of industry for welding carbon and alloy steels (including stainless steels) is reviewed. Attention is also given to the hardfacing of metallurgical equipment parts, cutting tools, and dies and to the composition of fluxes and their manufacture. Chapter VII was written by Yu. A. Yuzwenko, who also participated in writing the second part of Chapters II and IX. Chapter VIII was

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Ceramic Fluxes for Automatic (Cont.)

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written by K. V. Bagryanskiy, Candidate of Technical Sciences. The authors thank M. P. Grebel'nik and I. V. Lyakhova, scientific research workers, V. M. Kiryakov and V. G. Svetsinkiy, Engineers, and A. N. Metel'skiy, V. A. Kovalevskiy, and B. F. Narynskiy for their assistance. There are 94 references, mostly Soviet.

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8/125/61/000/003/011/016  
A161/A133

AUTHORS: Kushnerov, D.M.; Svetsinskiy, V.G.

TITLE: Semiautomatic welding of low-carbon steel by open arc using magnetic flux

PERIODICAL: Avtomaticheskaya svarka, no. 3, 1961, 95 - 97

TEXT: The article presents a brief general information on the welding method and detailed technological recommendations. The method has been suggested in 1950 by A.I. Khodzhayev and is based on the property of magnetic flux to stick to the welding wire. The flux is made magnetic by addition of powdered iron. The electro-thermic laboratory of the Institut elektrotekhniki AN USSR (Institute of Electric Engineering AS UkrSSR) has developed a ceramic magnetic M-10 flux for the semiautomatic welding of low-carbon steel, and a ДШМ-2 (DSHM-2) holder. The M-10 flux is based on the  $\text{CaO-MgO-CaF}_2\text{-TiO}_2\text{-SiO}_2$  slag system. Its composition is the following (in %): 19.5 - 21.0  $\text{CaCO}_3$ ; 6.3 - 7.0  $\text{MgO}$ ; 15.0 - 17.0  $\text{CaF}_2$ ; 7.7 - 9.0  $\text{TiO}_2$ ; 12.0 - 15.0  $\text{SiO}_2$ ; 22.0 - 24.0  $\text{Fe}$ ; 3.0 - 3.5  $\text{Mn}$ ; 3.0 - 3.3  $\text{Si}$ ; 1.2 - 1.4  $\text{Ti}$ ; 0.05  $\text{S}$ ; 0.05  $\text{P}$ ; up to 3% other constituents. The constituents are given in a table including the state standard (GOST) numbers and the weight %

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Semiautomatic welding of low-carbon steel by....

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A161/A133

in the mixture of each. The constituents are: Marble 22%, fluorspar 17%, magnesite brick 7%, rutile concentrate 9%, quartz sand 11%, ferromanganese 4%, ferro-silicon 4%, ferrotitanium 6%, powder iron 20%, sodium silicate 15.0%. The flux ensures satisfactory mechanical properties, good shape of welds, sound weld metal and an easily separating slag crust. The recommended welding current and electrode feed rate are given in a table for different wire diameters (2 and 1.6 mm) and different welding positions (horizontal, inclined and vertical). The productivity of the process is 2.5 times higher than of manual arc welding with УОНИИ-13/45 (UONII-13/45) electrodes, and more than double compared to semiautomatic CO<sub>2</sub>-shielded welding. The special holder has a ring magnet preventing flux spilling when the welding is stopped. The 6 mm diameter aperture in the holder provides for uniform flux feed. The holder is used with the wire feed mechanisms of ПШ-5 (PSh-5) of ПШ-54 (PSh-54) welders and requires no design changes. The method has been tested with success at the "Bol'shevik" Plant and the Barnaul'sky kotel'nyy zavod (Barnaul Boiler Plant). There are 2 figures. X

ASSOCIATION: Institut elektrotekhniki AN USSR (Institute of Electrotechnics AS UkrSSR)

SUBMITTED: July 10, 1960

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KUSHNER, D. M. SVETSINSKIY, V. G.

Investigating the automatic welding of highly-resistant cast iron  
under ceramic flux. Avtom. svar. 16 no.9:53-60 S '63.

1. Institut elektrosvarki im. Ye.O.Patona AN UkrSSR. (MIRA 16:10)



ACCESSION NR: AT4012863

S/3069/63/000/000/0099/0110

AUTHOR: Kushnerev, D. M.; Kir'yakov, V. M.

TITLE: Investigation of the effect of alloying elements on the properties of high-manganese austenitic weld metal

SOURCE: Svarka spetsial'ny\*kh metallov i splavov. Kiev, Izd-vo AN UkrSSR, 1963, 99-110

TOPIC TAGS: welding, austenitic steel, weld metal, manganese steel alloying element, nickel, manganese, steel welding, alloy steel

ABSTRACT: Lately, the welding of high-strength medium-alloy steel is acquiring increasing importance, but still presents severe difficulties (crack formation) due to the high content of C and alloying elements. Austenitic Cr-Ni steel is commonly used as the weld metal. However, due to the high cost of Ni, it would be advantageous to replace this with a nickel-free high-manganese weld metal which would still have an austenitic structure. In addition, ceramic fluxes are used to prevent oxidation and introduce modifying elements into the weld. The present authors studied the structure and mechanical properties of welds made with Sv-08 electrode wire, the composition of the weld metal being modified via the flux. As shown in Fig. 1 of the Enclosure, the optimal Mn content

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ACCESSION NR: AT4012863

in the weld metal was 27-30%. The addition of modifying elements such as Ti, Al, Si, V, Mb and Cr was also found to improve the structure and mechanical properties; in particular, a high Cr content together with Al and Ti guaranteed high resistance to crack formation. X-ray analysis of the weld metal structure confirmed the results of mechanical tests and showed that the austenitic structure was only preserved with a Mn content within the limits of 25-34%. Orig. art. has: 1 table and 8 figures.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 13Feb64

ENCL: 01

SUB CODE: MM

NO REF SOV: 004

OTHER: 003

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Card

ACCESSION NR: AT4012863

ENCLOSURE: 01

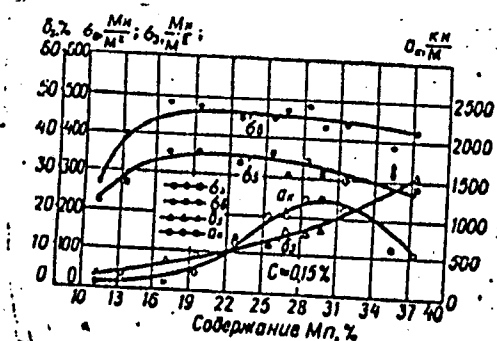


Fig. 1 - Effect of the Mn content in % on the mechanical properties of high-manganese weld metal (0.15%C).

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ACCESSION NR: AT4012864

S/3069/63/000/000/0111/0120

AUTHOR: Kushnerev, D. M.; Lyakhovaya, I. V.

TITLE: Investigation of automatic welding of high temperature nickel alloys with ceramic fluxes

SOURCE: Svarka spetsial'ny\*kh metallov i splavov. Kiev, Izd-vo AN UkrSSR, 1963, 111-120

TOPIC TAGS: welding, automatic welding, nickel welding, flux, ceramic flux, nickel alloy welding, high temperature nickel alloy

ABSTRACT: The principal problem in the welding of high temperature nickel alloys is the tendency to the formation of hot cracks and the necessity of obtaining the same heat resistance in the weld seam as in the base metal. The present investigation considered the possibility of using ceramic flux for this purpose. After reviewing the literature on the effects of alloying and modifying elements on crack formation, the authors report experiments in which alloy VL7-45U and EI-437B were welded with EI-868 and EI-395 wire under fluxes in which the alloying components were ferrotitanium, ferroaluminum, aluminum-niobium alloy, nickel-magnesium alloy and chromium-niobium alloy. These results showed that during welding with fine wire, such as SvKh20N10G6, the properties

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ACCESSION NR: AT4012864

of the weld seam are improved by decreasing the  $Al_2O_3$  content of the flux. Work was also done with the welding of austenitic steel 1Kh18N9T in various fluxes, which indicated that sodium aluminate should be used in preference to liquid glass, thus lowering the Si content in the weld seam. Finally, the tendency to crack formation was found to be decreased by the introduction of niobium into the weld seam via the flux. Orig. art. has: 4 tables and 2 figures.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 13Feb64

ENCL: 00

SUB CODE: MM

NO REF SOV: 003

OTHER: 004

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Card

BR

ACCESSION NR: AP4029257

S/0125/64/000/004/0047/0054

AUTHOR: Kushnerev, D. M. (Candidate of technical sciences)

TITLE: Phase composition of high-alloy manganese and chromium-manganese weld-on metal

SOURCE: Avtomaticheskaya svarka, no. 4, 1964, 47-54

TOPIC TAGS: metal, weldon metal, FeMn alloy, FeMnCr alloy, weldon metal phase composition

ABSTRACT: Results are reported of x-ray-diffraction, dilatometric, and metallographic analyses of the phase composition of Fe-Mn and Fe-Mn-Cr alloys, depending on the chemical composition, and thermal and mechanical treatments. The Mn content was varied within 11-34%, Cr content, up to 10%; the C content was 0.20% or lower. The weld-on metal was produced by a ceramic-flux automatic-welding process. Metallic Mn and Cr were introduced into a lime-magnesia-type flux which also contained small additions of ferrotitanium, ferro-aluminum, and ferrosilicon. It was found that: (1) A brittle  $\epsilon$ -phase is present

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ACCESSION NR: AP4029257

in the Fe-Mn alloy containing 11-28% Mn and in the Fe-Mn-Cr alloy containing 16-22% Mn; (2) Upon heating the Fe-Mn alloy to 180-280C, an  $\epsilon \rightarrow \gamma$  phase transformation, accompanied by a sharp increase in the metal volume, takes place; the  $\gamma \rightarrow \epsilon$  transformation takes place at 60-20C; the metal volume varies much less with temperature in Fe-Mn-9% Cr alloy; (3) The  $\epsilon$ -phase is formed in both slow-cooled and hardened specimens of the weld-on metal; (4) The maximum  $\epsilon$ -phase content occurs in the Fe-20% Mn and Fe-20% Mn-Cr alloys; they have minimum toughness and plasticity; (5) The impact deformation stimulates the  $\gamma \rightarrow \epsilon \rightarrow \alpha$  transformation. Orig. art. has: 8 figures and 2 tables.

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona AN UkrSSR (Institute of Electric Welding, AN UkrSSR)

SUBMITTED: 16Aug63

DATE ACQ: 27Apr64

ENCL: 00

SUB CODE: *mm*

NO REF SOV: 005

OTHER: 002

Card 2/2

ACC NR: AP6032533

SOURCE CODE: UR/0413/66/000/017/0133/0133

INVENTOR: Kushnerev, D. M.; Svetaiskiy, V. G.; Kir'yakov, V. M.; Kuznetsov, V. I.; Polikarpov, B. S.

ORG: none

TITLE: Ceramic flux for submerged arc welding of high-strength steels. Class 49, No. 185676 [announced by the Electric Welding Institute im. Ye. O. Paton, AN UkrSSR (Institut elektrosvarki AN UkrSSR)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 17, 1966, 133

TOPIC TAGS: automatic welding, high strength steel welding, *ARC WELDING,*  
*CERAMIC MATERIAL*

ABSTRACT: This Author Certificate introduces a ceramic flux for submerged arc welding of high-strength steels containing calcium fluoride, rutile concentrate, ferrotitanium, and ferromanganese. To improve the mechanical properties of welded joints and the technological properties of the flux, 5—12% quartz sand, 3—6% manganese ore, 4—6% manganese metal, 1% aluminum powder, and 18—24% sodium disilicate are added to the flux composition. The rest of the components are taken in the following proportion: 10—18% fluorspar, 30—40% rutile concentrate, 0—2% ferrotitanium and 3—5% ferro manganese.

SUB CODE: 13/ SUBM DATE: 23Jan65/

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UDC: 621.791.048



KOMAROV, N.G.; SOBOLEV, V.A.; BASHMAKOV, A.I.; EMMAUSSKIY, A.V., kand.  
istor.nauk; RUDAKOVA, A.G.; MOSKALETS, Ye.S.; KUSHNIREV, K.Ya.;  
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(MIRA 13:6)

(Kirov--Guidebooks)

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<p>Preparation of acetylene in the interrupted discharge.  M. Ya. Kushnerev and A. B. Shekhter. <i>J. Phys. Chem.</i>  U. S. S. R. 13, 259-60(1959).—On passing an impulse  discharge through anthracene oil, a gas contg. 22-30%  C<sub>2</sub>H<sub>2</sub> is obtained. The energy required is 11-12 kw. per  cu. m., and is practically independent of the capacity from  5.10<sup>-4</sup> <math>\mu</math>F. to 0.25 <math>\mu</math>F. F. H. Rathmann</p>																																																			
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Electron microscope study of dehydration of crystal hydrates. C.R. Acad. Sci.  
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(BA - A I Ja '53:81)

KUSHNEREV, M.Ya., SHMUK, Ye.I. and ROGINSKIY, S.Z.

"Topography of the Pyrolytic Decomposition of Barium Permanganate." Izv. Akad. Nauk, (1950), 6, 573-575.

SO: Translation- 2524467, 30 Apr 1954.

*Catalytic activity and structure of active zinc oxide. III. Influence of the method of preparation of zinc oxide catalysts on their x-ray structure.* A. B. Shchekter, M. Ya. Koshnitsky, and Yu. Sh. Moshkovskii (Inst. Phys. Chem., Acad. Sci. U.S.S.R., Moscow). *Izv. Akad. Nauk S.S.S.R., Khim. Nauk* 1951, 339-44; cf. C.A. 44, 7132n. — A series of samples of ZnO catalysts were prepd. by (I) decomposition of ZnCO<sub>3</sub> at 360° in vacuo, and (II) oxidation of Zn vapor in the elec. arc, with both series subsequently heated in vacuo 2 hrs. at a definite temp. between 900 and 1000°. By Debye x-ray line widths, crude (i.e. not heat-treated) preps. I have finer crystals (mean dimension  $m = 36 \text{ \AA}$ ) than II ( $m = 56 \text{ \AA}$ ). Heating to 900, 700, 800, and 1000° produces in series I an increase of  $m$  (47, 62, 63, and 77 Å), but practically no change in series II. Original preps. of I have a less perfect lattice than has II, and the defectiveness decreases on heating; whereas in preps. II heating produces no change up to 1000°. ZnO I, after heating to 700°, acquires

approx. the same dispersity and degree of lattice perfection as II.

N. Thon  
Comparative study of the promoters for dehydrogenation catalysts. János Varga, Gyula Rabó, and A. Zalai (Univ. Tech. Sci., Budapest, Hung.). *Acta Chim. Hung.* 1, 137-45 (1951) (in English). — The investigation was undertaken to compare the changes in activity brought about by different promoters and also to ascertain the extent of the change in surface area of the catalyst caused by various promoters when the same catalyst is used with different promoters. Al<sub>2</sub>O<sub>3</sub> was the carrier with various amounts of Cr<sub>2</sub>O<sub>3</sub> as the catalyst activated with K<sub>2</sub>O, with oxides of K and Ce, with Th oxide, and with oxides of K and Th. A catalyst contg. Mo oxide was also tested. None of the catalysts tested gave a 100% yield. The selectivity, indicated by a decrease in the extent of cracking reactions and the efficiency of production of aromatics, mainly toluene, increased

with the amount of Cr<sub>2</sub>O<sub>3</sub> up to an optimum proportion.

Catalysts contg. Cr<sub>2</sub>O<sub>3</sub> were sensitive to variations of temp. or of space velocity. Addn. of an optimum amt. of K<sub>2</sub>O increased the yield of aromatics and reduced the sensitivity of Cr<sub>2</sub>O<sub>3</sub> catalysts to variations in temp. and space velocity. Greater amts. of K<sub>2</sub>O considerably reduced the cracking reactions, but simultaneously increased the sensitivity. The presence of Ce oxide increased the advantageous effects of K<sub>2</sub>O. Th oxide as a promoter had effects similar to K<sub>2</sub>O, but the yield of aromatics and the selectivity were not increased to the same extent as with K<sub>2</sub>O. Catalysts contg. Cr<sub>2</sub>O<sub>3</sub> became less sensitive against influences of temp. and space velocity when Th oxide was used as the promoter. Catalysts contg. Mo were the most suitable of all of the 10 catalyst types tested. The compn. of catalysts, expressed in mol. proportions of the metals, was: Al:Cr 1:0.01, Al:Cr 1:0.0255, Al:Cr 1:0.102, Al:Cr:K 1:0.102:0.00907, Al:Cr:K 1:0.102:0.011, Al:Cr:K 1:0.102:0.0165, Al:Cr:K:Ce 1:0.102:0.011:0.00187, Al:Cr:Th 1:0.102:0.0007, Al:Cr:K:Th 1:0.102:0.011:0.0007, and Al:Mo 1:0.028. The expts. were conducted with a gasoline fraction, b. 130°, contg. aromatics 14, paraffins 59, and naphthenic hydrocarbons 47% by wt.

István Fialdy

5(4)

AUTHORS:

Krylov, O. V., Kushnerev, M. Ya., Fokina, Ye. A.

SOV/62-58-12-3/22

TITLE:

Investigation of the Dependence of the Catalytic Activity of Binary Compounds of Metals of the Second Group With Non-Metals Upon the Position of the Elements in the Mendeleev Periodic System (Izucheniye zavisimosti kataliticheskoy aktivnosti binarnykh soyedineniy metallov vtoroy gruppy s nemetallami ot polozheniya elementov v periodicheskoy sisteme Mendeleyeva) Communication 4: Catalytic Decomposition of Isopropyl Alcohol on Zinc Selenide and Telluride (Soobshcheniye 4. Kataliticheskoye razlozheniye izopropilovogo spirta na selenide i telluride tsinka)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1958, Nr 12, pp 1413-1421 (USSR)

ABSTRACT:

The present paper deals with the investigation of the catalytic activity of selenides and tellurides of metals of the second group with respect to the dehydration and dehydrogenation of isopropyl alcohol. It is a continuation of the investigations carried out with the oxides and sulfides of metals of the same group (Refs 1-3). The investigation methods employed are de-

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Investigation of the Dependence of the Catalytic Activity of Binary Compounds of Metals of the Second Group With Non-Metals Upon the Position of the Elements in the Mendeleev Periodic System. Communication 4: Catalytic Decomposition of Isopropyl Alcohol on Zinc Selenide and Telluride

scribed (Refs 1-3). The ZnSe preparation was supplied by M. S. Belen'kiy, the ZnTe preparation by N. A. Goryunova, and chemically pure tellurium by A. V. Novoselova. The decomposition of isopropyl alcohol on ZnSe and ZnTe within the temperature range 20-140° was investigated. It was found that the reaction in principle develops in the direction of dehydrogenation. In the reaction a decrease of the catalytic activity of ZnSe and ZnTe is observed. The activation energy of the dehydrogenation of alcohol on ZnSe increases from 15 to 21 kcal/mol. The ZnSe sample annealed in air at 600° was less active than that not annealed. Elementary tellurium has a low catalytic activity. Radiographic and electronographic investigations as a result of comparison of thermodynamic characteristics showed that the phase changes of the catalyst are due to impurities in the basic sample and on temperature effects, but in no case on the course of catalysis. There are 11 figures, 3 tables, and 10 references, 7 of which are Soviet.

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SOV/62-58-12-3/22

Investigation of the Dependence of the Catalytic Activity of Binary Compounds of Metals of the Second Group With Non-Metals Upon the Position of the Elements in the Mendeleyev Periodic System. Communication 4: Catalytic Decomposition of Isopropyl Alcohol on Zinc Selenide and Telluride

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences, USSR)

SUBMITTED: June 1, 1957

Card 3/3

20-119-1-28/52

AUTHORS: Isayev, O. V., Kushnerev, M. Ya, Margolis, L. Ya.

TITLE: On a Copper Catalyst for the Oxidation of Propylene to Acrolein (O mednom katalizatore okisleniya propilena v akrolein)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1, pp. 104-106 (USSR)

ABSTRACT: First a short report is given on previous papers dealing with the same subject. Several patents recommended the application of cupric oxide which has to be applied to different carrier materials. The following problems remained unsettled: What is the phase composition of the copper contacts? What happens to the catalyst during the reaction and which oxide is catalytically active? For settling these problems 3 series of experiments were carried out, the following catalysts being used: 1) CuO; 2) Cu<sub>2</sub>O; 3) metallic copper applied to pumice stone. The phase composition of the catalysts before and after the experiment was roentgenographically investigated. The roentgenographs were taken by a Debye (Debye)-chamber of a diameter of 57,3 mm with the K<sub>α</sub>-radiation of iron. The catalysts were tested for 40 minutes in a dynamic device under atmospheric pressure in a mixture of propylene

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20-119-1-28/52

## On a Copper Catalyst for the Oxidation of Propylene to Acrolein

and air (10 - 12 % propylene and about 20 % oxygen) in a temperature interval between 300 and 400°C. A figure shows the results of the identification of the roentgenographs of 3 catalysts. The application of cupric oxide in an air-propylene-mixture at 300°C does not modify the phase composition of the catalyst. Raising the temperature to 400°C leads to a reduction of the cupric oxide to protoxide and also to metal. Originally existing cuprous oxide was reduced to copper under these conditions. The sweeping of the copper by an air-propylene-mixture at 300°C leads to its partial oxidation to  $\text{Cu}_2\text{O}$ . The additional electronographic investigation of these catalysts showed that after its application in a propylene-air-mixture the surface of all investigated samples was covered with a layer of cuprous oxide. Thus, the cupric oxide in the presence of a propylene-air-mixture is reduced to the system  $\text{Cu}_2\text{O} + \text{Cu}$  and metallic copper is oxidized to cuprous oxide. Propylene in the presence of cuprous oxide is oxidized to acrolein and in the gases developing in this process almost no oxygen is contained. Consequently the catalyst during the reduction has an effect in a reducing medium and therefore a transition  $\text{Cu}_2\text{O} \rightarrow \text{Cu}$  is possible. By changing the relation propylene : oxygen in the

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20-119-1-28/52

On a Copper Catalyst for the Oxidation of Propylene to Acrolein

reaction mixture the reduction of the cuprous oxide can either be suppressed or intensified. The composition of the catalyst is automatically regulated by the existence of the reversible process of the reduction of  $\text{Cu}_2\text{O}$  to Cu and the oxidation of Cu to  $\text{Cu}_2\text{O}$ . There are 2 figures and 8 references, 3 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR  
(Institute for Physical Chemistry AS USSR)

PRESENTED: August 6, 1957, by V. N. Kondrat'yev, Member, Academy of Sciences, USSR

SUBMITTED: July 25, 1957

Card 3/3

5(4)

AUTHORS: Isayev, O. V., Kushnerev, M. Ya.

SOV/20-124-4-36/67

TITLE: The Investigation of the Phase-Composition of the Copper Catalyst for the Oxidation of Propylene to Acrolein (Izucheniye fazovogo sostava mednogo katalizatora okisleniya propilena v akrolein)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 4, pp 858-860 (USSR)

ABSTRACT: The phase transformations were continuously controlled by means of radiographic recordings in the course of the reaction itself. These pictures were taken by means of a specially constructed camera, the constructional principles of which are described in form of a schematical drawing. The temperature of the catalyst was recorded by means of a thermocouple and was kept constant with an accuracy of  $\pm 1^\circ$ . The X-ray beam dispersed by the sample was recorded on a plane film. For the catalyst investigated, good resolution and a satisfactory intensity of reflections was attained by using an X-ray tube of the type BSV-4-Cu without filter. Like in a previous paper, copper oxide, cuprous oxide, and metallic

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SOV/20-124-4-36/67

The Investigation of the Phase-Composition of the Copper Catalyst for  
the Oxidation of Propylene to Acrolein

copper were investigated. The copper oxide was produced by the oxidation of Cu and  $\text{Cu}_2\text{O}$  by atmospheric oxygen. The cuprous oxide was produced according to a method developed by D. N. Finkel'steyn (Ref 2). All experiments were carried out at atmospheric pressure in a gas mixture of the following composition: propylene 15%, oxygen 15%, and nitrogen 70%. The results obtained by identification of the X-ray pictures of the catalysts are shown by two diagrams. In the oxidation of propylene over copper oxide at  $310^\circ$  the catalyst was reduced, and after operation of 240 minutes cuprous oxide was radiographically determined. An increase of temperature ( $343$  and  $370^\circ$ ) increases the rate of reduction considerably. Besides the formation of cuprous oxide a metallic phase could in both cases be observed, which occurs all the more rapidly the higher the experimental temperature. If, however, the propylene is oxidized for 135 minutes over  $\text{CuO}$  ( $370^\circ$ ), only one phase, namely only metallic copper, is observed. The same results are obtained by the oxidation of propylene over cuprous oxide. Details are given. By oxidation of propylene

Card 2/4

SOV/20-124-4-36/67  
 The Investigation of the Phase-Composition of the Copper Catalyst for  
 the Oxidation of Propylene to Acrolein

on a copper oxide catalyst a highly reactive compound is obtained, viz. acrolein, is obtained, which may enter into an oxidation- and polymerization reaction in the volume phase and also on the surface of the catalyst at temperatures of 400-450°. It was therefore of interest to investigate the influence exercised by acrolein upon the phase conversions of the copper oxide. The passing of a mixture of acrolein vapors (0.5%) with nitrogen leads to the reduction of copper oxide to  $\text{Cu}_2\text{O} + \text{Cu}$ . The addition of oxygen to the gas mixture sharply slows down the reduction of the catalyst, and a polymer film is formed. By treating a copper film by a mixture of acrolein (0.5-5.0%), oxygen (15%), and nitrogen at 400° for 2-3 hours the copper is oxidized to copper oxide, and at the same time a polymer film is produced on the surface of the catalyst. There are 3 figures and 2 Soviet references.

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The Investigation of the Phase-Composition of the Copper Catalyst for  
the Oxidation of Propylene to Acrolein

SOV/20-124-4-36/67

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR  
(Institute for Physical Chemistry of the Academy of Sciences,  
USSR)

PRESENTED: October 6, 1958, by V. I. Spitsyn, Academician

SUBMITTED: October 3, 1958

Card 4/4



TOMASHOV, N.D.; AL'TOVSKIY, R.M.; KUSHNEROV, M.Ya.

Method for removing thin oxide films from titanium surfaces and study of their structures. Zav.lab. 26 no.3:298-301 '60. (MIRA 13:6)

1. Institut fizicheskoy khimii Akademii nauk SSSR.  
(Titanium oxides)

20112

9.4300 (and 1035, 1143)

S/181/61/003/002/010/050  
B102/B204

AUTHORS: Kushnerav, M. Ya., Linde, V. R., and Roginskiy, S. Z.

TITLE: The electric conductivity of cobalt-manganese spinels with additions of lithium-, titanium- and copper oxides

PERIODICAL: Fizika tverdogo tela, v. 3, no. 2, 1961, 384-394

TEXT: After a detailed discussion of Western publications, the present paper deals with the results obtained by studying the structure and the electric conductivity of "direct" ( $\text{CoMn}_2\text{O}_4$ ) and "inverse" ( $\text{MnCo}_2\text{O}_4$ ) cobalt-manganese spinels with Li-, Ti- and Cu admixtures.  $\text{CoMn}_2\text{O}_4$  is a nearly direct tetragonal spinel with the parameters  $a = 5.72 \text{ kX}$ ,  $c = 9.29 \text{ kX}$ , the parameters of the oxygen anion  $x = 0.327$ ,  $z = 0.365$  and a cation distribution (per unit cell):  $\text{Co}_{6.8}^{2+}\text{Mn}_{1.2}^{3+}[\text{Co}_{1.2}^{2+}\text{Mn}_{4.8}^{3+}]_{32}^{2-}$ .  $\text{MnCo}_2\text{O}_4$  is a purely "inverse" cubic spinel with the parameters  $a = 8.27 \text{ kX}$ ,  $u = 0.382$  and the cation distributions a)  $\text{Co}_8^{3+}[\text{Mn}_8^{2+}\text{Co}_8^{3+}]_{32}^{2-}$  or b)  $\text{Co}_8^{2+}[\text{Mn}_8^{4+}\text{Co}_8^{2+}]_{32}^{2-}$ . The composition of the Card 1/8

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S/181/61/003/002/010/050  
B102/B204

The electric conductivity of...

specimens investigated is given in the table. The specimens were obtained by heating of spinel powder with the corresponding oxides in corundum crucibles in air at 1200°C for 2 hr. The agglomerate obtained was again finely ground and heated under the same conditions, after which it was slowly cooled to room temperature. The alloys obtained were first subjected to X-ray examination. The electric conductivity of the specimens pressed to 24 8-8 mm tablets was investigated within the range of 100-600°C by means of d.c. probes; the measurements were carried out in quartz vacuum cells. The specimens were first heated in the cells at  $10^{-6}$  mm Hg at 650°C for 2 hr, after which pure argon was introduced (up to 5 mm Hg); in this atmosphere the specimens remained till temperature and resistance equilibrium had been established; only then were the measurements carried out. Control measurements were carried out at higher and lower temperature. The measured values obtained were translated into specific values. The X-ray structural investigations produced the following results: Li admixtures to a 'direct' spinel caused the reconstruction of the tetragonal lattice to a perturbed cubic spinel with parameters similar to the "inverse" spinel. If one assumes that the

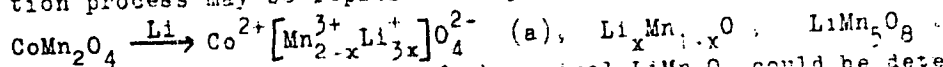
Card 2/8

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S/181/61/003/002/010/050  
B102/B204

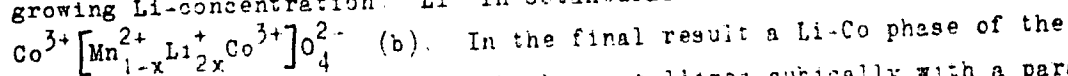
The electric conductivity of...

Li-atoms replace part of the Mn-cations in octahedral order, this substitution process may be represented by:



Radiographically, the line of the spinel  $\text{LiMn}_5\text{O}_8$  could be determined. With

the introduction of Li into the cubic lattice of the "inverse" spinel, the tetragonal distortion of the lattice increases; a decreases linearly with growing Li-concentration.  $\text{Li}^+$  in octahedral order substitutes  $\text{Mn}^{2+}$ ,



composition  $\text{Li}_x \text{Co}_{1-x} \text{O}$  results, which crystallizes cubically with a parameter of about 4.2 Å. An addition of 5% titanium to a "direct" spinel causes a considerable disturbance of the tetragonal lattice, without, however, a new phase occurring; higher additions cause a re-formation of the lattice to rhombohedral structure when an ilmenite-type lattice compound is formed. With 51.4% titanium, the spinel phase vanishes completely, and small vestiges of titanium oxide occur. Analogous phenomena occurred with an addition of titanium to an "inverse" spinel. In general

Card 3/8

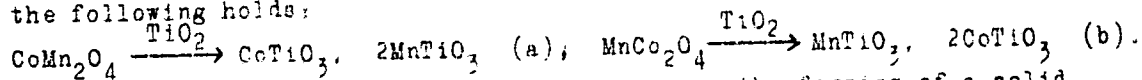
20112

S/181/61/003/002/010/050

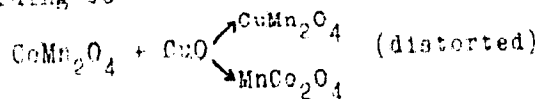
B102/B204

The electric conductivity of

the following holds:



An addition of copper to "direct" spinel causes the forming of a solid substitution solution. A re-formation of the tetragonal lattice to a cubic lattice according to



occurs. The "inverse" spinel reacts quite differently with CuO: Up to 25 at% Cu, no chemical reaction at all occurs between  $\text{MnCo}_2\text{O}_4$  and CuO. All specimens (nos. 19, 20, 21) showed lines of the pure, very weakly deformed  $\text{MnCo}_2\text{O}_4$ , of copper oxide and of cuprous oxide. The results obtained by measurements of electric conductivity are shown in Figs. 3 and 4. As may be seen, the introduction of additions to "inverse" spinels produces no qualitative effect upon  $\sigma(T)$ ; also the activation energy of conductivity remains constant. All spinels investigated were p type semiconductors.

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20112

The electric conductivity of...

S/181/61/003/002/010/050  
B102/B204

The  $\sigma(T)$ -measurements of all specimens showed that the mechanism of the electric conductivity of the complex spinels cannot be brought into line with the model by Verwey. As regards the effect produced by the various admixtures it is not the structural change that produces an essential effect upon the electric properties of the spinels, but the valence state and the chemical composition of its cationic components. The authors finally thank A. I. Zaslavskiy for discussions and V. F. Shustov for his help. K. P. Belov, Ye. V. Talalayeva, and B. T. Kolomiyets are mentioned. There are 5 figures, 1 table, and 17 references: 5 Soviet-bloc and 6 non-Soviet-bloc.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR Moskva (Institute of Physical Chemistry of the AS USSR, Moscow) X

SUBMITTED: April 8, 1960 (initially) and October 1, 1960 (after revision)

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20112

The electric conductivity of...

S/181/61/003/002/010/050  
B102/B204

Legend to the figures:  
The numbers beside the  
straight lines are the  
numbers of the specimens.  
The ordinate is  $\lg \sigma + 6$ ,  
where  $\sigma$  is the specific  
electric conductivity.

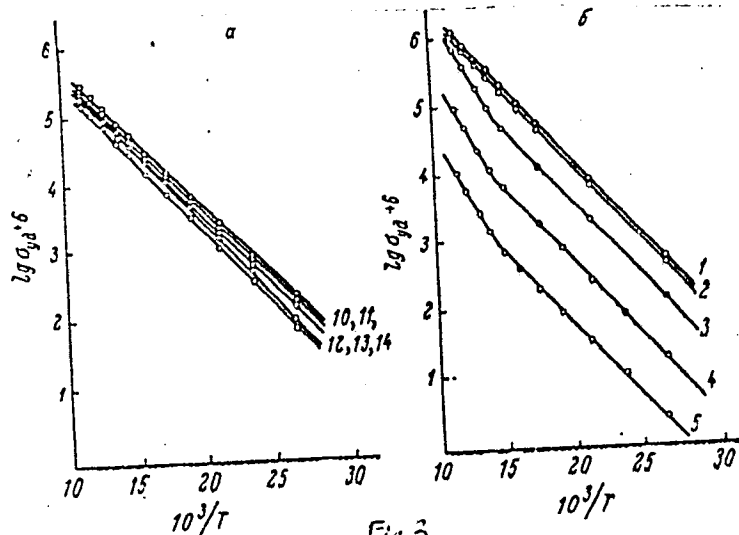


Fig 3

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S/181/61/003/002/010/050  
B102/B204

The electric conductivity of...

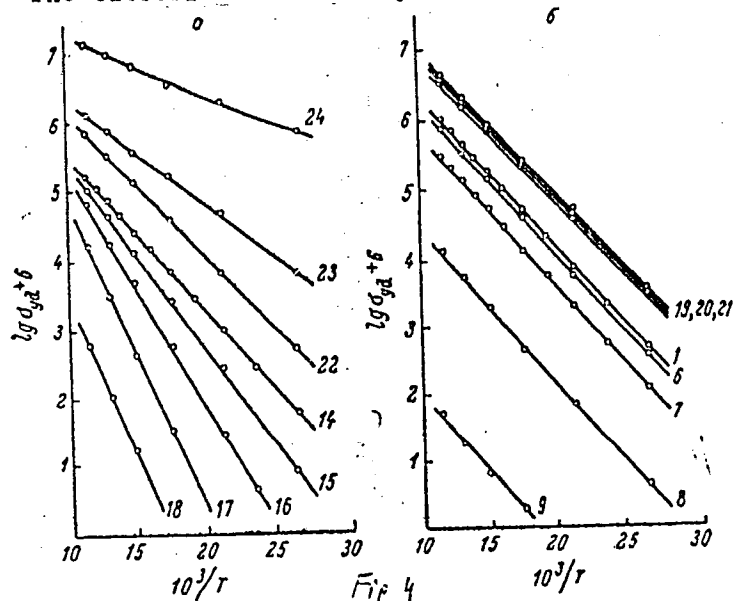


Fig. 4

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S/181/61/003/002/010/050

B102/B204

The electric conductivity of...

1 Номер шпинеля (рис. 1)	2 Прямая шпинель	1 Номер шпинеля (рис. 1)	2 Обратная шпинель
14	CoMn <sub>2</sub> O <sub>4</sub>	1	MnCo <sub>2</sub> O <sub>4</sub>
10	CoMn <sub>2</sub> O <sub>4</sub> + 5.2Li	2	MnCo <sub>2</sub> O <sub>4</sub> + 5.4Li
11	CoMn <sub>2</sub> O <sub>4</sub> + 21.4Li	3	MnCo <sub>2</sub> O <sub>4</sub> + 22.0Li
12	CoMn <sub>2</sub> O <sub>4</sub> + 35.4Li	4	MnCo <sub>2</sub> O <sub>4</sub> + 36.0Li
13	CoMn <sub>2</sub> O <sub>4</sub> + 45.0Li	5	MnCo <sub>2</sub> O <sub>4</sub> + 46.0Li
15	CoMn <sub>2</sub> O <sub>4</sub> + 5.3Ti	6	MnCo <sub>2</sub> O <sub>4</sub> + 5.5Ti
16	CoMn <sub>2</sub> O <sub>4</sub> + 10.4Ti	7	MnCo <sub>2</sub> O <sub>4</sub> + 11.0Ti
17	CoMn <sub>2</sub> O <sub>4</sub> + 26.5Ti	8	MnCo <sub>2</sub> O <sub>4</sub> + 27.0Ti
18	CoMn <sub>2</sub> O <sub>4</sub> + 51.4Ti	9	MnCo <sub>2</sub> O <sub>4</sub> + 52.5Ti
22	CoMn <sub>2</sub> O <sub>4</sub> + 5.0Cu	19	MnCo <sub>2</sub> O <sub>4</sub> + 5.0Cu
23	CoMn <sub>2</sub> O <sub>4</sub> + 10.0Cu	20	MnCo <sub>2</sub> O <sub>4</sub> + 10.0Cu
24	CoMn <sub>2</sub> O <sub>4</sub> + 25.0Cu	21	MnCo <sub>2</sub> O <sub>4</sub> + 25.0Cu

Legend to the table: 1) no. of specimen; 2) "direct" spinel; 3) "inverse" spinel.

Card 8/8

GORDEYEVA, V.A.; YEGOROV, Ye.V.; ZHABROVA, G.M.; KADENATSI, B.M.;  
KUSHNEREV, M. Ya.; ROGINSKIY, S.Z.

Use of ionizing radiation in the study of the decomposition  
processes of copper and nickel oxalates. Dokl. AN SSSR 136  
no.6:1364-1367 F '61. (MIRA 14:3)

1. Institut fizicheskoy khimii AN SSSR. 2. Chlen-korrespondent  
AN SSSR (for Roginskiy).

(Copper oxalate)  
(Nickel oxalate)  
(Radiation)

S/020/61/141/004/014/019  
B101/B110

AUTHORS: Tomashov, N. D., Al'tovskiy, R. M., and Kushnerev, M. Ya.

TITLE: Examination of structure of passive oxide films on the surface of titanium

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 4. 1961, 913 - 916

TEXT: The authors studied composition and structure of passivating films forming in auto-passivation of Ti in various solutions and in anodic passivation. Reference is made to a previous paper (Zav. lab., no. 3 (1960)). Here, the oxide film forming on oxidizing in air on titanium and its alloys BT-5 (VT-5), BT3 (VTZ), and BT3-1 (VTZ-1) was found to consist of  $TiO_2$ . In this case, the oxide film was loosened from the metal base by means of a 5% Br solution in anhydrous methanol, and electrographically analyzed by "transmission". In the present study, the same method was used. Composition and structure of films forming on Ti were examined: (1) in auto-passivation in 5% HCl, 5%  $H_2SO_4$ , 6%  $HNO_3$ , 1 N NaCl, 1 N NaOH at room temperature; (2) in anodic oxidation in 40%  $H_2SO_4$  at the

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S/020/61/141/004/014/019  
B101/B110

Examination of structure of...

potentials -0.05, +1, and +8 v; (3) in oxidation in boiling 65%  $\text{HNO}_3$ . It was found: (A) Orientation of the metal layer due to polishing of the surface causes an orientation of the crystals of the oxide film; (B) All diffraction patterns of the oxide films obtained by the solutions mentioned under (1) and (2) for -0.05 and +1 v agreed best with the diffraction pattern of titanium oxide having the composition  $\text{Ti}_2\text{O}_3 \cdot (3-4)\text{TiO}_2$ ; (C) In the case of (2) at +8 v, and in the case of (3), the oxide film consists of  $\text{TiO}_2$  having an anatase structure which contains a small quantity of rutile. Electron diffraction patterns obtained by reflection agreed with the transmission electron diffraction patterns. This confirms that removing the film from the titanium surface did not cause a structural change. Conclusion:  $\text{TiO}_2$  forms under rigorous oxidation conditions. Under milder conditions (auto-passivation at room temperature, anodic oxidation at a positive potential not being too high), the lower oxide,  $\text{Ti}_2\text{O}_3 \cdot (3-4)\text{TiO}_2$ , forms. Under conditions being still milder, the formation of even lower titanium oxides is possible. There are 2 figures.

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Examination of structure of...

S/020/61/141/004/014/019  
B101/B110


2 tables, and 15 references: 10 Soviet-bloc and 5 non-Soviet-bloc. The two references to English-language publications read as follows: P. H. Morton, W. M. Baldwin, Trans. Am. Soc. Metals, 44, 1004 (1953); S. Ogawa, D. Watanabe, Sci. Rep. Res. Inst. Tohoku Univ., no. 2, 184 (1955).

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

PRESENTED: July 5, 1961, by V. I. Spitsyn, Academician

SUBMITTED: July 4, 1961

Card 3/3



KUSHNEREV, M. YA

S/844/62/000/000/115/129  
D207/D307

AUTHORS: Roginskiy, S. Z., Zhabrova, G. M., Gordeyeva, V. A.,  
Yegorov, Ye. V., Kadenatsi, B. M. and Kushnerov, M. Ya.

TITLE: The use of ionizing radiation in investigation of topo-  
chemical processes

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii.  
Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 668-673

TEXT: A study was made of the differences between the topochemical processes of thermal decomposition and of decomposition, using 0.6 Mev electrons. The substances decomposed were copper oxalate ( $\text{CuC}_2\text{O}_4 \cdot 1/2\text{H}_2\text{O}$ ) and nickel oxalate ( $\text{NiC}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$ ) which were prepared by precipitating nitrate solutions with oxalic acid at 50°C; the samples were in the form of thin layers of powder. Thermal decomposition in vacuum at 280°C yielded 85% Cu + 15%  $\text{Cu}_2\text{O}$  and 95% Ni + 2.0% NiO + 3% undecomposed residue. Thermal decomposition in air at about 300°C yielded 50% CuO + 50%  $\text{Cu}_2\text{O}$  and 100% NiO. Elec-

Card 1/2

S/844/62/000/000/115/129  
D207/D507

The use of ionizing ...

tron irradiation ( $3.6 \times 10^9$  -  $3.3 \times 10^{10}$  rad) at  $100^\circ\text{C}$  yielded usually pure metals with large (10 - 40%) residues undecomposed oxalates; the metal yield increased with the radiation dose. Strong preliminary irradiation (at least  $0.6 \times 10^9$  rad) accelerated strongly the subsequent thermal decomposition in vacuum. The mechanisms of thermal and electron-bombardment decomposition were the same; holes generated by heat or irradiation neutralized partly or completely the double charged oxalate ions which then moved to the surface and were emitted as  $\text{CO}_2$ ; electrons also generated by heat or irradiation neutralized the doubly charged metal cations which yielded pure metals. Oxides were formed as an intermediate stage in the production of pure metals; in air, oxides were produced also by oxidation of the pure metal products. The essential difference between electron bombardment and heat lay in the greater carrier-generation efficiency of the former. There are 2 figures and 1 table.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, AS USSR); Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AS USSR)

Card 2/2

S/204/62/002/005/003/007  
E075/E136

AUTHORS: Krylov, O.V., Kushnerev, M.Ya., and Fokina, Ye.A.

TITLE: Formation of active surface in the catalysts for  
the polymerization of ethylene oxide

PERIODICAL: Neftekhimiya, v.2, no.5, 1962, 697-704

TEXT: In view of the low activity of technical BeO and MgO, the authors studied the preparation of the active oxide catalysts by decomposing Be and Mg hydroxides and carbonates. The action of catalytic poisons (H<sub>2</sub>O and CO<sub>2</sub>) was also investigated. A MacBain balance was used to follow the decomposition and the adsorption kinetics of ethylene oxide (related to polymerization kinetics), CO<sub>2</sub> and H<sub>2</sub>O. Adsorption of ethylene oxide occurs before polymerization, the rate of adsorption being proportional to log t (t = time). Subsequent polymerization takes place at a constant rate which depends on the number of active polymerization centres on the catalyst surface. The catalytic activity grows with the degree of decomposition of the hydroxides. The most active MgO has 30-50% of its surface covered by water. For Be(OH)<sub>2</sub> the most active catalyst results after its complete dehydration.

Card 1/2



Formation of active surface in the ... S/204/62/002/005/003/007  
E075/E136

Freshly prepared MgO and BeO reduce their high activity on exposure to air, whilst their surface areas decrease by only 10-20%. This is explained by the preferential adsorption of water on the active centres, which lowers the adsorption and polymerization of ethylene oxide. Initial adsorption of CO<sub>2</sub> leads to the increase of ethylene oxide adsorption, but decreases the polymerization rate by a factor of 4-5. Further CO<sub>2</sub> adsorption has no effect. It is inferred from the adsorption kinetics that the active centres are Mg<sup>2+</sup> or Be<sup>2+</sup> ions interacting with the oxygen in ethylene oxide molecules. There are 9 figures and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR  
(Institute of Chemical Physics, AS USSR)

SUBMITTED: May 5, 1962

Card 2/2

KUSHNEREV, M.Ya.; STEPANOV, Yu.N.

Study of the phase of modified silver. Zhur. prikl. khim. 36  
no.4:912-914 Ap '63. (MIRA 16:7)

(Silver)

KRYLOV, O. V.; KUSHNEREV, M. Ya.; FOKINA, Ye. A.; MARKOVA, Z. A.

3

"Elementary mechanism of heterogeneous catalytic polymerization of ethylene oxide."

report submitted to 3rd Intl Cong on Catalysis, Amsterdam, 20-25 Jul 64.

L 61052-65 EMT(m)/EPF(c)/EMP(j)/T Pc-4/Pr-4 RM UR/0190/65/007/006/0984/0991  
 ACCESSION NR: AP5016500 66.095.264+678.55

AUTHORS: Krylov, O. V.; <sup>44,55</sup> Kushnerov, M. Ya.; <sup>44,55</sup> Markova, Z. A.; <sup>44,55</sup> Fokina, Ye. A. <sup>44,55</sup>

TITLE: Mechanism of the heterogeneous catalytic polymerization of ethylene oxide <sup>44,55</sup>

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 6, 1965, 984-991

TOPIC TAGS: polymer, resin, ethylene oxide, heterogeneous catalysis, reaction mechanism

ABSTRACT: The investigation was carried out with the view of establishing criteria for the selection of ethylene oxide polymerization catalysts. The work is an extension of the work of O. V. Krylov, Ye. A. Fokina (Sb. Kataliticheskiye reaktsii v zhidkoy faze, Izd. AN. KazSSR, Alma-Ata, 1963, str. 389). Experiments were performed at 25°C. The experimental results are summarized in Fig. 1 on the Enclosure. A reaction mechanism for the reaction is proposed. Orig. art. has: 4 graphs, 1 equation, and 3 illustrations.

ASSOCIATION: Institut khimicheskoy fiziki, AN SSSR (Institute for Chemical Physics, AN SSSR) <sup>44,55</sup>

Card 1/3

L 61052-65

ACCESSION NR: AP5016500

SUBMITTED: 26Jun64

ENCL: 01

SUB CODE: 00,00

NO REF SOT: 008

OTHER: 006

Card 2/3

L 61052-65

ACCESSION NR: AP5016500

ENCLOSURE: 01

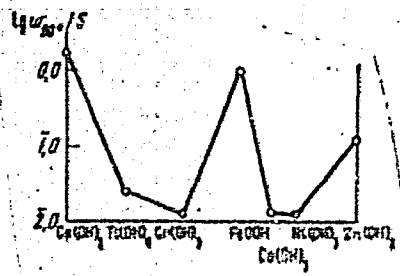


Fig. 1. Change in the specific catalytic activity of IV period metal hydroxides

Card 3/3

ACC NR: AP7004065 SOURCE CODE: UR/0190/67/009/001/0045/0051

AUTHOR: Berlin, A.A.; Cherkashin, M.I.; Kisilitsa, P.P.; Kushnerev, M.Ya.

ORG: Institute of Chemical Physics, AN SSSR (Institut khimicheskoy fiziki AN SSSR)

TITLE: Study of structural changes in electrical and physical properties of polyphenylacetylene in the course of heat treatment

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 9, no. 1, 1967, 45-51

TOPIC TAGS: pyrolysis, polymer heat effect, polymer structure, electric property, crystallography, phenyl compound, acetylene, conjugated polymer

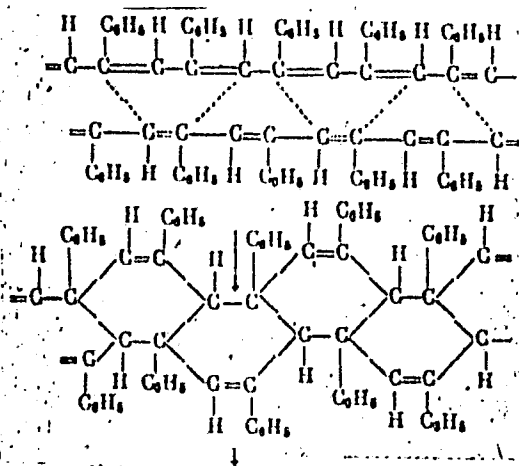
ABSTRACT: A study has been made of the effect of heat treatment at 300—700C in an inert medium on the morphology, chemical structure, electrical properties, and paramagnetic properties of polyphenylacetylene. The electrical measurements were carried out for pressed pellet specimens at 20—400C. It was shown that heat treatment causes substantial changes in electrical, paramagnetic, and crystallographic properties. As the heat treatment temperature (HTT) increases from 330 to 700C, crystallinity and conductivity increase (from  $10^{-15}$  to  $10^{-2}$  mh./cm), activation energy for conduction decreases (from 1.50 ev at HTT = 400C to 0.19 ev at

Card 1/3

UDC: 678.01:53/54+678.76

ACC NR: AP7004065

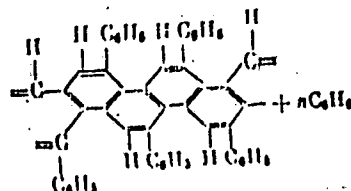
HTT = 700C), and unpaired spin concentration goes through a maximum at 600C. In the 600—700C HTT range, there is a transition from a cubic or pseudocubic lattice to a tetragonal lattice; this transition is accompanied by a sharp change in electrical conductivity (from  $10^{-7}$  to  $10^{-2}$  mho/cm) and paramagnetism. Changes in IR spectra with increasing HTT suggested that three-dimensional network structure formation takes place:



Card 2/3



ACC NR: AP7004065



To determine the effect that the three-dimensional network formation and crystallinity in polyphenylacetylene have on conductivity, the properties of the phenylacetylene-p-diethylbenzene copolymer and the polyphenylacetylene-p-diethylbenzene block copolymer which has a three-dimensional network structure were studied. The crystalline structure was crystalline for the copolymer and amorphous for the block copolymer but both had conductivity of the order of only  $10^{-16}$  mho/cm. This indicates that crystallinity and a three-dimensional network structure are not sufficient conditions for a high conductivity in conjugated polymers. [SM]

SUB CODE: 11, 20/ SUBM DATE: 30Oct65/ ORIG REF: 004/ OTH RFP: 003  
ATD PRESS: 5114

Card 3/3

KUSHNIREVA, A. G. Cand Med Sci -- (diss) "Clinical observations of the  
dynamics of <sup>blood</sup>serum proteins and certain other <sup>biochemical</sup>indicators in cases of hypertension."  
Dnepropetrovsk, 1958. 14 pp (Min of Health UkrSSR. Dnepropetrovsk Med Inst).  
200 copies (KL, 13-58, 100)

DZYAK, V.N., dotsent; KUSHNEROVA, A.G., kand.med.nauk; BASHMAKOVA, I.N.

Clinical significance of some biochemical indexes in hypertension.  
Vrach. delo no.4:140 Ap '61. (MIRA 14:6)

1. Kafedra fakul'tetskoy terapii (zav. - prof. B.A.Zalkind)  
Dnepropetrovskogo meditsinskogo instituta.  
(HYPERTENSION)

ACC NR: AR6035106 SOURCE CODE: UR/0137/66/000/008/E003/E003

AUTHOR: Amelina, L. S.; Kushnereva, A. K.; Rizol', A. I.

TITLE: Structural features of bimetallic welds produced by the explosion method

SOURCE: Ref. zh. Metallurgiya, Abs. 8E19

REF SOURCE: Sb. Proiz-vo trub. Vyp. 16. M., Metallurgiya, 1965, 86-89

TOPIC TAGS: metal welding, plastic deformation, bimetal, bimetal weld, bimetal welding

ABSTRACT: An investigation was made of welds of Al-Al, Cu-Cu, ST-10-MZS alloys and Al-brass alloys produced by pulsed loading. It has been determined that the development of considerable plastic deformation at the contact surfaces of metals to be welded during their contact is a prerequisite for insuring a strong coherence between the metals in explosive welding. The heat generated by contact surfaces presumably produces diffusive redistribution of atoms between the metals being welded and therefore leads to the formation of a transition layer, differing in chemical composition from the initial metals. V. Fomenko. [Translation of abstract]

[AM]

Card 1/1 SUB CODE: 13/ UDC: 621.791.1.011

SHUR, A.B.; DIFENOV, G.V.; KUSHNEROVA, M.N.; BABIY, A.S.; TOLISKIY, A.A.

New developments in research. Stal' 25 no.8:709-710 Ag '65.  
(MIRA 18:8)

KUSHNEREVICH, N.R.

VODNEV, G.G.; SHELKOV, A.K.; DIDENKO, V.Ye.; FILIPPOV, B.S.; TSAREV, M.N.;  
ZASHVARA, V.G.; LITVINENKO, M.S.; MEDVEDEV, K.P.; MOLODTSOV, I.G.;  
IGALOV, K.I.; RUBIN, P.G.; SAPOZHNIKOV, L.M.; TYUTYUNNIKOV, G.N.;  
DMITRIYEV, M.M.; LEYTES, V.A.; LERNER, B.Z.; MEDVEDEV, S.M.; REVIYAKIN,  
A.A.; TAYCHER, M.M.; TSOGLIN, M.E.; DVORIN, S.S.; RAK, A.I.; OBUKHOV-  
SKIY, Ya.M.; KOTKIN, A.M.; ARONOV, S.G.; VOLOSHIN, A.I.; VIROZUB, Ye.V.;  
SHVARTS, S.A.; GINSBURG, Ya.Ye.; KOLYANDR, L.Ya.; BELETSKAYA, A.F.;  
KUSHNEREVICH, N.R.; BRODOVICH, A.I.; NOSALEVICH, I.M.; SHTROMBERG, B.I.;  
MIROSHNICHENKO, A.M.; KOPELIOVICH, V.M.; TOPORKOV, V.Ya.; AFONIN, K.B.;  
GOFTMAN, M.V.; SEMENENKO, D.P.; IVANOV, Ye.B.; PEYSAKHZON, I.B.;  
KULAKOV, N.K.; IZRAELIT, E.M.; KVASHA, A.S.; YAPTAN, S.I.; CHERMONYKH,  
M.S.; SHAPIRO, A.I.; KHALABUZAR', G.S.; SEKT, P.Ye.; GABAY, L.I.;  
SMUL'SON, A.S.

Boris Iosifovich Kustov; obituary. Eoks i khim. no.2:64 '55.(MLRA 9:3)  
(Kustov, Boris Iosifovich, 1910-1955)

KUSHNEVSKIY, Ya.V.

3(6)

PEASE I BOOK EXPLOITATION

SOV/1934

Leningrad. Nauchno-issledovatel'skiy institut zemnogo magnetizma,  
ionosfery i rasprostraneniya radiovoln

Trudy, Vyp. 13. (Transactions of the Institute of Scientific  
Research on Terrestrial Magnetism, the Ionosphere, and Radio  
Wave Propagation. Nr. 13) Moscow, Gidrometeoizdat (Otd-nie),  
1957. 118 p. 1,120 copies printed.

Additional Sponsoring Agency: USSR. Ministerstvo svyazi.

Ed. (Title page): Ya.L. Al'pert; Ed. (Inside book): V.I. Tarkhunova;  
Tech. Ed.: V.V. Mayorov.

PURPOSE: This issue of the Institute's Transactions is intended  
for geophysicists and technical personnel working in research  
organizations as well as for advanced students at universities  
and technical vuzes. It is also of interest to communications  
personnel.

Card 1/3

Transactions of the Institute (Cont.)

SOV/1934

COVERAGE: This publication contains six articles on aspects of radio wave propagation. Two articles by Ya.I. Likhter treat questions dealing with atmospheric noise and interference. Articles by S.V. Borodina and G.B. Lopatina deal with long-wave radio wave propagation. All articles include diagrams, figures, tables, and references.

TABLE OF CONTENTS:

Borodina, S.V. A Study on the Propagation of Long and Ultra-long Radio Waves by Means of Analyzing the Forms of Atmospherics.	3
Likhter, Ya.I. A Method for Determining the Functions of the Distribution of Atmospheric Interferences	31
Likhter, Ya.I. Certain Features Inherent to the Function of the Distribution of Field Intensity of Atmospheric Noise	63

Card 2/3



Transactions of the Institute (Cont.)

SOV/1934

Kushnerevskiy, Yu.V. An Experimental Set-Up for Studying the  
Homogeneous and Non-Stationary Structure of Ionosphere 72

Kalinin, Yu.K. The Problem of Phase Velocity and Direction  
of the Normal Toward the Front of the Radio Waves Above  
a Non-homogeneous Surface 87

Lopatina, G.B. The Changeability of the Signal Strength of Long-  
Wave Stations 110

AVAILABLE: Library of Congress

MM/lab  
6-22-59

Card 3/3

KUSHNEREVSKIY, Yu.V.

In the upper atmosphere. Nauka i zhizn' 24 no.3:11-13 Mr  
'57. (MLRA 10:5)

1. Starshiy nauchnyy sotrudnik Nauchno-issledovatel'skogo  
instituta zemnogo magnetizma, ionosfery i rasprostraneniya  
radiovoln.

(Atmosphere, Upper)

KUSHNEREVSKIY, Yu.V.; ZAYARNAYA, Ye.S.

Drift of a small-scale irregularities in the F2 layer. Dreify 1 neodn.  
v ionosf. no.1:22-23 '59. (MIRA 13:1)  
(Ionosphere)

89757

S/169/61/000/002/010/039  
A005/A001

9.9110 (also 1041, 1046)

Translation from: Referativnyi zhurnal, Geofizika, 1961, No. 2, p. 11, # 2652

AUTHORS: Kushnerevskiy, Yu. V., Zayarnaya, Ye. S.

TITLE: The Drift of Small-Scale Inhomogeneities in the F2-Layer

PERIODICAL: V sb.: Dreyfy i neodnorodnosti v ionosfere. No. 1. Moscow, AN SSSR, 1959, pp. 22-33 (English summary)

TEXT: Results are presented of the measurement of a drift of small-scale inhomogeneities in the F2-region of the ionosphere by the method of the spaced reception with a small base in the period from January 1956 to December 1958. The observations were carried out by the ИЗМИР АН СССР (IZMIR of the Academy of Sciences of the USSR) (Moscow). The applied apparatus and the method of processing the records are briefly described. It is shown that west- and east directions of drift predominate in the F2-layer with small deflections northwards and southwards. The most probable is the westward direction. The magnitude of velocity lies within the limits of 20 - 300 m/sec, most often  $V = 80$  m/sec was found. The comparison of the data from drifts in the ionosphere for several

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89757

The Drift of Small-Scale Inhomogeneities in the F2-Layer S/169/61/000/002/010/039  
A005/A001

points of the USSR showed that, side-by-side with the local specific features of the motions of inhomogeneities, a general circulation apparently takes place in the ionosphere. It is emphasized that it is necessary to apply the correlation analysis for obtaining more complete information on inhomogeneities in the ionosphere. The character of distribution of the amplitudes of signals reflected from the ionosphere was studied. It is shown that not the Rayleigh-distribution, but a two-humped distribution took place in 35% of the events considered, which, perhaps, is explained by the existence of two independent processes in the ionosphere, superimposed on each other. It is pointed out that among the records of fading often, in particular by day, sine-shaped periodical oscillations (with a period of 0.5 - 40 sec) are found, the existence of which can be explained, in the author's opinion, by the existence in the ionosphere of travelling wave-like perturbations of the kind of plasma oscillations. There are 5 references.

E. Kazimirovskiy

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

KUSHNEREVSKIY, YU V.

Г. М. Вереща

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

В. Е. Кашинский

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

Г. М. Вереща

В. Е. Кашинский

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

II номер  
(с 10 до 16 часов)

Е. М. Федоров

А. Е. Петровский

О влиянии параметров радиоприемника на качество приема радиосигнала в условиях помех

С. М. Давыдов (Чехословакия)

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

М

В. А. Зорин

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

В. Е. Кашинский

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

В. Е. Кашинский

А. Е. Петровский

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

II номер  
(с 18 до 22 часов)

В. Е. Кашинский (США)

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

В. Е. Кашинский

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

В. Е. Кашинский

Исследование влияния параметров радиоприемника на качество приема радиосигнала в условиях помех

М

report submitted for the Confidential Meeting of the Scientific Technological Society of  
Radio Engineering and Electrical Communications in A. S. Popov (VSE), Moscow,  
8-18 June, 1959

KUSHNEREVSKIY Yu. V.

В. А. Гурин,  
В. Н. Маслаков

О применении центрального органа управления  
в задачах расчета от неровностей поверхности на-  
ряда при волнении

В. Е. Кибир,  
М. Ф. Котаренко,  
Т. Г. Третьяков

Формы распределения уровня сигнала (модель  
для измерения)

10 июня  
(с 10 до 16 часов)

В. Н. Гурин,  
В. Н. Маслаков

К теории обработки информации радиотехни-  
ческих систем

В. А. Гурин,  
Ю. В. Кузнецовский,  
С. Ф. Котаренко

Синтез оптимальных систем управления на основе  
матричного метода

В. А. Гурин,  
С. Ф. Котаренко

54

Ю. В. Кибир,  
М. Ф. Котаренко

О применении методов теории систем, основан-  
ных на функциональных соотношениях информации

В. А. Гурин,  
М. В. Кузнецовский,  
Т. А. Кибир

Синтез оптимальных систем управления на основе  
матричного метода

В. А. Гурин,  
Т. А. Кибир

Об оптимальном выборе информации при  
использовании радиотехнических систем

10 июня  
(с 16 до 22 часов)

В. А. Кибир

Расчет оптимальных систем управления на основе  
матричного метода

М. Ф. Котаренко

Графоаналитический способ расчета систем радио-  
техники для различных условий работы

55

report submitted for the Centennial Meeting of the Scientific Technological Society of  
Radio Engineering and Electrical Communications in A. S. Popov (YUZHIN), Moscow,  
8-12 June, 1959





ACCESSION NR: AT3012750

S/2831/60/000/002/0019/0032

AUTHORS: Grishkevich, L. V.; Gusev, V. D.; Kushnerevskiy, Yu. V.;  
Mirkotan, S. F.; Porshkin, Ye. G.

TITLE: Results of investigations of ionospheric inhomogeneities  
and their motions, obtained at the Soviet stations during the IGY

SOURCE: AN SSSR. Mezhdunarodn. komit. po prov. Mezhdunarodn.  
geofizich. goda. 5 razdel program. MGG: Ionosfera. Sb. statey, no.  
2, 1960, 19-32

TOPIC TAGS: ionosphere, ionospheric inhomogeneity, international  
geophysical year, upper atmosphere circulation, diurnal variation,  
seasonal variation, drift in the ionosphere, radio wave reflection,  
inhomogeneity lifetime

ABSTRACT: This is a preliminary report of systematic observations  
made in the Soviet Union as part of the International Geophysical

Card 1/4

ACCESSION NR: AT3012750

Year and aimed at investigating the circulation of the upper atmosphere, the diurnal and seasonal variations, the behavior of ionospheric-wind velocity, latitudinal and longitudinal effects, and the connection of various geophysical phenomena with drift in the ionosphere. The stations at which the motions in the ionosphere were investigated are listed and the measurement equipment and procedures briefly described. Data are presented on the magnitude and direction of the drift velocity in the E and F2 layers; the anisotropy of the form of the inhomogeneities in the F2 layers and the statistical properties of the inhomogeneous structure of the ionosphere, as described by the behavior of the turbidity coefficient; the angular spectrum and angles of arrivals of the reflected radio waves; random drift of the ionosphere and the lifetime of the inhomogeneities; the amplitude distribution; and period fluctuations. The authors state that although the presence of latitudinal or longitudinal regularities in the parameters investigated cannot be deduced as yet, it is obvious that the variations of the small-

Card 2/4

ACCESSION NR: AT3012750

scale inhomogeneities are of local character. Comparison of ionosphere drift investigations made by different methods indicates that both large and small scale inhomogeneities participate in the general circulation of the ionosphere, their different behaviors are probably due to different origin, and a common cause controls their motion. The preliminary results indicate good agreement between the data obtained in the Soviet Union and abroad. It is urged that the obtained data be reduced in a more precise fashion than afforded by similarity methods, using correlation analysis and electronic computers. The article is an abbreviation of a paper based on work performed by N. M. Yerofeyev and V. P. Perely'gin (Ashkhabad), L. V. Grishkevich and N. A. Mityakov (NIRFI, Gorkiy), Yu. V. Kushnerevskiy and Ye. S. Zayarnaya (IZMIRAN, Moscow), V. D. Gusev, L. A. Drachev, S. F. Mirkotan, Yu. V. Berezin, M. P. Kiyanovskiy (Moscow, MGU), V. E. Zelenkov and V. N. Checha (Tomsk, SFTI); B. L. Kashcheyev, Ye. G. Proshkin, V. V. Tolstov, and N. T. Tsimbal (Kharkov, KhPI) and V. Kokurin (Simenz). Orig. art. has: 11 figures,

Card 3/4

ACCESSION NR: AT3012750

3 tables, and 2 formulas.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 22Oct63

ENCL: 00

SUB CODE: AS, AI

NO REF SOV: 013

OTHER: 007

Card 4/4

28421

S/169/61/000/007/091/104

A006/A101

9,9100

AUTHORS: Samardzhiyev, D.T., Kushnerevskiy, Yu.V.

TITLE: Disturbance displacement in F2 layer

PERIODICAL: Referativnyy zhurnal. Geofizika, no. 7, 1961, 39, abstract 7G273 (V sb. "Issled. neodnorodnostey v ionosfere no. 4", Moscow, AN SSSR, 1960, 38 - 44, English summary)

TEXT: The author describes a method of determining displacement of disturbances in layer F2. The f-graphs from 5 ionospheric stations from March 1958 to December 1959 were used. Results of analysis show that in layer F2, the disturbances move at an average speed of about 173 m/sec. Most probable speed values are within 60 - 100 and 140 - 180 m/sec. Two main directions of motion were observed, namely from the east to the west and from the north to the south. West-east motion was almost absent. CH

The authors' summary

[Abstracter's note: Complete translation]

Card 1/1

S/169/61/000/005/044/049  
A005/A130

9.9110

AUTHORS:

Kushnerevskiy, Yu.V., Zayarnaya, Ye.S.

TITLE:

Shape anisotropy of small-scale inhomogeneities and motions in the F2 layer

PERIODICAL:

Referativnyy zhurnal, Geofizika, no. 5, 1961, 30, abstract 5 G 254. (Issled.neodnorodnostey v ionosfere. No. 4. Moscow, AN SSSR, 1960, 45-56 (English summary))

TEXT:

Application of the total correlation analysis method considerably increases the quantity of data characterizing the properties of small-scale inhomogeneities and their motions. It turned out that there exists considerable anisotropy with preferential orientation in the direction of extension of the small-scale inhomogeneities of the F2 layer. The size and lifetime of these inhomogeneities vary considerably from day-time to nighttime. It is shown that the drift velocities determined by means of correlation analysis are lower than those determined by the method of similar fadings. The directions of motion determined by both methods

Card 1/2

Shape anisotropy of small-scale inhomogeneities.. S/169/61/000/005/044/049  
A005/A130  
agree well and show a preferential direction of motion westward at night and eastward by day. The drift velocity components evince diurnal variation. The authors show that the velocities of chaotic motion and diffusion processes in the F2 layer play a considerable role in the behavior of small-scale inhomogeneities.

[Abstractor's note: Complete translation.]

Author's summary

Card 2/2

S/169/61/000/006/037/039  
A005/A130

99100

AUTHORS: Mirkotan, S.F., Kushnerevskiy, Yu.V., Gusev, V.D.

TITLE: The motions of inhomogeneities of different sizes in the ionosphere

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 6, 1961, 30, abstract 6G244. (V sb.: Issled. neodnorodnostey v ionosfere. No. 4, Moscow, AN SSSR, 1960, 57-69 (English summary))

TEXT: The similarity of anisotropy in shape of large- and small-scale inhomogeneities points to an influence of the earth's magnetic field on inhomogeneities. The identity in behavior of some parameters characterizing the inhomogeneities, the general trend of the variation of the direction of motion and a number of other factors indicate the existence of general principles affecting the behavior of both types of inhomogeneity. However, the relation between variation in size and the lifetime of these sizes, which is opposite for large and small inhomogeneities, and the opposite direction of the latitude component of the drift rate point

Card 1/2

The motions of inhomogeneities of different ...

S/169/61/000/006/037/039  
A005/A130

to different origins for these inhomogeneities. The essential role of  
diffusive and chaotic processes is noted, especially for small-scale in-  
homogeneities.

Authors' summary

[Abstractor's note: Complete translation.]

Card 2/2



<sup>1</sup>  
KUSHNAREVSKIY, YU. V., BOYENKOVA, N. M., PUSHKOV, N. V.

"Vertical Travelling Disturbances in the Ionosphere." ((I-5-9)).

report submitted for the Intl. Conf. on Cosmic Rays and Earth Storm (IUPAP)  
Kyoto, Japan 4-15 Sept. 1961.

KUSHNEREVSKIY, Yu., kand.tekhn.nauk

Motion of nonhomogeneities in the ionosphere. Radio no.7:36-37  
J1 '61. (MIRA 14:10)  
(Ionospheric radio wave propagation)

KUSHNEREVSKIY, Yu.V.

Meeting of the working group for ionospheric research. Mezhdunar.  
geofiz. god. no.9:50-53 '61. (MIRA 14:3)  
(Ionospheric research)

9.9/20

S/169/62/000/008/082/090  
E032/E114

AUTHORS: Boyenkova, N.M., and Kushnerevskiy, Yu.V.

TITLE: Vertical drift of disturbances in the ionosphere

PERIODICAL: Referativnyy zhurnal, Geofizika, no.8, 1962, 26,  
abstract 8 G 193. (In the Symposium: 'Ionosfern.  
issledovaniya no.9' ('Ionosphere Studies no.9'),  
M., AN SSSR, 1961, 63-68) (abstract in English).

TEXT: Reports preliminary results of a study of the vertical  
drift of disturbances in the ionosphere. It is noted that IGY  
ionograms recorded in succession at five-minute intervals during  
RMD and SMI suggest the frequent appearance of large-scale  
disturbances in the electron-density distribution in the F2-layer  
maximum. These disturbances eventually reach the E layer. They  
appear in the form of additional inflections on ionograms and the  
effective altitude of these inflections gradually decreases. The  
vertical component of the velocity of such disturbances is  
40-80 m/sec. They reach the E layer in 40-70 minutes, give rise  
to a short-period increase in radio-wave absorption, and then

Card 1/2

Vertical drift of disturbances ...

S/169/62/000/008/082/090  
E032/E114

disappear. The disturbances show a tendency to repeat with a period of about one hour, and may appear at almost any time of the year. In this connection it is noted that it is necessary to carry out a detailed analysis of ionograms in F1-layer parameter determinations, since additional inflections on ionograms which are due to large-scale disturbances are very similar to those which are inherent in the regular F1-layer. It is suggested that continuous IQSY observations of the state of the ionosphere should be carried out during RMD and SMI in order to provide more detailed information on the dynamics and structure of these disturbances.

[Abstractor's note: Complete translation.]

Card 2/2

41089

S/058/62/000/008/116/134

A160/A101

9.9110

AUTHORS: Kushnerevskiy, Yu. V., Zayarnaya, Ye. S.

TITLE: Data on the drift in the  $F_2$  layer, obtained by different methods of processing

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1962, 29, abstract 8Zh210  
(In collection: "Ionosfern. issledovaniya, No. 9". Moscow, AN SSSR, 1961, 75 - 83; summary in English)

TEXT: Compared are the magnitudes of velocities and directions of the drifts in the ionosphere, obtained by two different methods: 1) by the method of similar fadings (Referativnyy zhurnal, Fizika, no. 1, 1958, 1735) and 2) by the method of the full correlation analysis (Referativnyy zhurnal, Fizika, 1961, 4Zh253). On the average, both methods yield the same results. However, "instantaneous" values of the velocity and the direction of movement, obtained by different methods, may essentially differ from one another. Apart from the fact that it yields more complete information on the properties of the irregular structure of the ionosphere and permits to take into consideration the effect

Card 1/2

S/058/62/000/008/116/134  
A160/A101

Data on the drift in the...

of the anisotropy of the form of irregularities on the magnitude and the direction of the velocity of the drift, the method of the full correlation analysis also gives more accurate readings of the temporary shifts of the maxima of the mutual correlation functions. A strong anisotropy of the form of irregularities leads to the presence of systematic errors when determining the direction of the movement, the average magnitude of which equals  $30^{\circ}$ . A comparison carried out, confirms the conclusion of other works that the vector of the apparent velocity must be oriented near the direction of the minor axis of the "characteristic ellipse". On the other hand, the mean error in determining the magnitude of the velocity is to be found within the limit of errors of both methods. Based on an examination of the criteria regarding the applicability of the method for processing primary data, the conclusion is drawn that the method of the full correlation analysis may be considered reliable and that it may be recommended for daily use.

[Abstracter's note: Complete translation]

Card 2/2

S/904/61/000/000/008/011  
D218/D308

AUTHORS: Vasil'yev, G. V., and Kushnerevskiy, Yu. V.

TITLE: Manually controlled ionospheric station with mechanical link between the transmitter and the receiver tuning

SOURCE: Doklady Nauchnogo simpoziuma po ionosfere, Rostov-na-Donu, 21-22 aprelya 1960 g. V razdel programmy MGG (ionosfera). Rostov on the Don, Izd-vo Rostov. univ., 1961, 89-100

TEXT: The station was designed for the study of absorption and winds in the ionosphere by vertical pulse sounding. Motions of small-scale irregularities were investigated using spatially separated receivers which recorded pulses reflected from the ionosphere. The three antennas were placed at the corners of a right-angle triangle with two equal sides of 110 m. The magnitude and direction of irregularity drifts were determined from

Card 1/2



Manually controlled...

S/904/61/000/000/008/011  
D218/D308

the time shift between corresponding points on the amplitude curves. The apparatus was developed at N3MWP (IZMIR) AS USSR. Its principal characteristics were: (1) frequency range-- $0.5 \div 16.0$  Mc/sec; (2) power per pulse-- $20 \div 50$  kW; (3) pulse length--100  $\mu$ sec; (4) pulse repetition frequency--50 cps; (5) receiver sensitivity--2  $\mu$ V; (6) mechanical link ensuring that transmitter and receiver were tuned to the same frequency; (7) the same transmitter could be used to operate on two or more fixed frequencies because wide-band amplifiers were employed. The apparatus has been used since 1958 for IGY measurements. Typical results showing velocity and direction distributions are reproduced. There are 7 figures.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation, AS USSR)

Card 2/2

KUSHNEREVSKIY, Yu.V.; MIRKOTAN, S.F.

Conference on the investigation of ionospheric winds: Geomag.1  
aer. 1 no.2:290-291 Mr-Apr '61. (MIRA 14:7)  
(Ionospheric research)

KUSHNEREVSKIY, Yu.V.; MIRKOTAN, S.F.

Movements of ionospheric irregularities; a survey. Geomag. 1  
aer. 1 no.4:453-478 J1-Ag '61. (MIRA 14:12)  
(Ionosphere)

S/169/62/000/010/057/071  
D228/D307

AUTHOR: Kushnerevskiy, Yu.V.

TITLE: Expanded conference of the group working on the ionosphere, April 20-23, 1960

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1962, 2-3, abstract 10G13 (Geofiz. byul. Mezhdunar. geofiz. kom-t pri Prezidiume AN SSSR, no. 11, 1962, 55-58)

TEXT: The All-Union Ionosphere Conference, called by the working group of the IGY Committee, was held in April 1960. The conference reviewed ionospheric research in the USSR and discussed scientific procedural questions and the course of scientific research work. The good work of all vertical sounding stations is mentioned. The results of all forms of ionospheric research went to the B<sub>2</sub> World Data Center in good time. At present the bulk of the materials, obtained from the Soviet Union's stations and available at the B<sub>2</sub> World Data Center, has been systematized and is being distributed to interested persons. The publication of vertical sounding

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Expanded conference ...

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data -- tables of hourly values for the main parameters of the ionosphere, and f-, h-, and M-diagrams -- has been started by decree of the Sovetskiy komitet IGG (Soviet IGY Committee). The publication of the results of wind and absorption measurements in the ionosphere is noted. It is pointed out that monthly (64% justification) 5-day (69% justification), and 12-hourly (84% justification) forecasts are being compiled at the IZMIRAN on the basis of information being received about the state of the ionosphere, geomagnetic phenomena, and the solar activity.

[Abstracter's note: Complete translation]

Card 2/2

KUSHNEREVSKIY, Yu.V.

Third All-Union Conference of the Ionosphere Section. Geofiz.bul.  
no.12:109-114 '62. (MIRA 16:5)  
(Ionosphere)

SPRENGER, K.; KUSHNEREVSKIY, Yu.V.

Some properties of the inhomogeneities in the lower ionosphere  
as revealed by long-wave observations. Geomag. i aer. 3 no.5:  
887-901 S-O '63. (MIRA 16:11)

1. Observatoriya ionosfernykh issledovaniy v Kyulungsborne,  
Germanskoy Demokraticheskoy Respubliki i Institut zemnogo mag-  
netizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

MIKKOTAN, Stanislav Fedorovich; MIKHAILOVICH, Yuriy Vladimirovich;  
KALININ, Yu.K., kand. fiz.-matem. nauk, otv. red.

[Collection of articles] Sbornik statei. Moskva, Izd-vo  
"Nauka." No.12 [Nonuniform structure and motions in the  
ionosphere] Neodnorodnaya struktura i dvizheniya v iono-  
sfera. 1963. 162 p. (mir 17:8)

1. Akademiya nauk SSSR. Mezhdunarodnyy komitet po pro-  
vedeniyu Mezhdunarodnogo geofizicheskogo goda. V razdel prog-  
rammy MGG. Ionosfera.



KUSHNEREVSKIY, Yu.V., kand. fiz.-matem. nauk, otv. red.; BOTNIKOVA,  
N.M., otv. red.; ZHITNIKOVA, S.A., red.

[Collection of articles] Sbornik statei. Moskva, Nauka.  
No.3. 1964. 170 p. (MIRA 18:1)

1. Akademiya nauk SSSR. Mezhdunarodnyy komitet po  
provedeniyu Mezhdunarodnogo geofizicheskogo goda. V razdel  
programmy MGG. Ionosfera.

KUSHNEREVSKIY, Yu.V.; MIRKOTAN, S.F.

Principal results of a study of ionospheric drifts. Geofiz. biul.  
no.14:67-82 '64. (MIRA 18:4)

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BOOK EXPLOITATION

S/

Mirkotan, Stanislav Fedorovich; Kushnerovskiy, Yuriy Vladimirovich

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Btl

Nonuniform structure and movements in the ionosphere (Neodnorodnaya struktura i dvizheniya v ionosfere) Moscow, Izd-vo "Nauka", 1964. 162 p. illus., biblio. 1000 copies printed. Responsible editor: Candidate of Physical-Mathematical Sciences Yu. K. Kalinin; Editor of the Publishing house: Ye. N. Milyutina; Technical editor: A. P. Yefimova

Series note: Akadeniya nauk SSSR. Mezhdunarodnyy geofizicheskiy komitet. v razdel programmy MGG: Ionosfera, No. 12

TOPIC TAGS: International Geophysical Year, ionosphere, nonuniform ionosphere, drift, upper atmosphere movement

PURPOSE AND COVERAGE: The purpose of this manual is to analyze the status of apparatus and research methods and to base their comparative analysis on materials obtained in the International Geophysical Year, having in mind unification of results and comparability of investigations during the International Year of the

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Quiet Sun. This manual includes recommendations concerning apparatus, method of investigation, and treatment of data (for investigations of the nonuniform ionosphere and movements in it).

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